



National Park Service Rock Creek Park Curriculum Based Program

Industrial Revolution Hits Home

Using the patented Oliver Evan's inventions within Peirce Mill as examples, students will examine the changes that occurred in the American Industrial Revolution, 1780-1860.

Curriculum Based Topics:

Technological change/ transfer, industrialization, urbanization, patents, map reading

Background Information:

The American Industrial Revolution took place between 1780 and 1860. It was a time of immense change in technology spurred mostly by the need to "do more with less people." Because the nation was expanding westward, able-bodied men were needed to blaze trails, set up posts and fight Native Americans. There simply were not enough people to do all the work. Therefore, many of the technological changes, like those inside Peirce Mill, made jobs simpler and reduced the number of people needed to complete them.

Milling is nothing new. People had been grinding grains for over 75,000 years and the Greeks are thought to have been the first to create a commercial mill. However, in 1795, Oliver Evans revolutionized milling in America. In his book, *The Young Millwright and Miller's Guide*, Oliver Evans described the first fully automated mill. Not only did the water power the grinding process, but it also powered the cleaning and sifting processes as well. Two grain elevators, which were powered by the water, and chutes utilizing gravity, moved the grain from one machine to the next.

The effects of this technology were far reaching. It reduced the number of people needed to work the mill from six or more to one or two. Flour and other grain products became cheaper to make and to buy. The technological aspects were also felt in other industries, including textiles, where automated mills soon followed. Today, many of our products are manufactured at automated mills.

Audience: Grades 5-6.

Length: 1 Hour.

Location: Peirce Barn (2401 Tilden Street, NW) or Peirce Mill

Students per group: maximum of 30

Chaperones per group: 3-5

Curriculum Based, Standards of Learning (Virginia Standards):

History

5.1 The student will describe life in America before the 17th century by evaluating *the impact of native economies on their religions, arts, shelters, and cultures;* life in the colonies in the 18th century from the perspective of large landowners, farmers, artisans, women, and slaves; * the principal economic and political connections between the colonies and England;

5.6 The student will describe growth and change in America from 1801 to 1861, with emphasis on * territorial exploration, expansion, and settlement, including the Louisiana Purchase, the Lewis and Clark expedition, the acquisition of Florida, Texas, Oregon, and California; * how the effects of geography, climate, canals and river systems, economic incentives, and frontier spirit influenced the distribution and movement of people, goods, and services

5.9 The student will develop skills for historical analysis, including the ability to * identify, analyze, and interpret primary sources (artifacts, diaries, letters, photographs, art, documents, and newspapers) and contemporary media (television, movies, and computer information systems) to better understand events and life in United States history to 1877; * construct various time lines of American history from pre- Columbian times to 1877 highlighting landmark dates, technological changes, major political and military events, and major historical figures

6.9 The student will analyze and explain Americans' responses to industrialization and urbanization

6.10 The student will develop skills for historical analysis, including the ability to * construct various time lines of United States history since 1877 including landmark dates, technological and economic changes

Goals: The program will:

1. Compare and contrast life before and after the American Industrial Revolution.
2. Introduce maps that demonstrate the industrialization and urbanization of Washington DC.
3. Demonstrate how Oliver Evans put together a series of simple machines in a way that revolutionized milling.

Safety and Resource Management Message:

1. Please do not harm, harass, or remove any native plants, animals, or historic artifacts from the park.

Books for the Classroom:

Beginners:

Little House. Burton, Virginia Lee. Houghton. 1978.
Urban Development

Something Beautiful. Wyeth, Sharon Dennis. DRAGONFLY. 2002.

When a little African American girl living in a big city goes looking for something beautiful in her neighborhood, she finds beauty comes in many different forms.

C is For City. Grimes, Nikki. BOYDS MILL. 2002.

Rhyming verses describe different aspects of life in a city, featuring each letter of the alphabet.

Round Trip. Jonas, Ann. Mulberry. 1990.

Black and white illustrations and text record the sights on a day trip to the city and back home again to the country.

Before and After: A Book of Nature Timescapes. Thornhill, Jan. National Geographic. 1997.

Middle Levels:

If You Lived 100 Years Ago. McGovern, Ann. Scholastic. 1999.

Home Place. Dragonwagon, Crescent. Simon Schu. 1993.

While out hiking, a family comes upon the site of an old house and finds some clues about the people who once lived there.

Life in America's First Cities. Isaacs, Sally Senzell. Heinemann. 2001.

Looks at the lives of the first Americans to set up cities in the United States. Discusses homes, shelter, food, clothes, schools, communications, and everyday activities.

Life on a Southern Plantation. Isaacs, Sally Senzell. Heinemann. 2001.

Looks at the lives of the first Americans to set up plantations in the United States. Discusses homes, shelter, food, clothes, schools, communications, and everyday activities.



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Pre-visit Activities:

A) Milling Minds (from MCPS Social Studies field trip to Peirce Mill):

1. Conduct a brainstorming session in which the class generates words or phrases they would associate with mills. Ask them to group the words according to commonalities and explain their reasons for such classification.

2. Ask students to determine the sequence of events needed to produce flour in the nineteenth century. The events below are in correct order. Present them on paper in scrambled order and have students (working in pairs or teams) cut them in strips and arrange them in the order they think is correct. Discuss the order with the entire class:

1. A farmer grows fields of wheat and corn.
 2. The farmer harvests the wheat and corn.
 3. The farmer transports the wheat and corn to the mill.
 4. The miller buys the wheat and corn from the farmer.
 5. The miller cleans the wheat and corn.
 6. Then the miller grinds the wheat and corn.
 7. As the wheat and corn is ground, it becomes flour.
 8. The miller sells the flour to a local general store.
 9. The local general store sells it to consumers.
3. Review with students the meaning of these economic terms:
- production - putting resources together to make goods or provide a service.
 - natural resources - those things found in or on the earth.
 - human resources - people doing mental or physical work.
 - capital resources - resources made by people and used to produce other goods and services. (Money is not considered a capital resource.)

Using the sequence of events in flour production, have the class give examples of some of the human resources (farmer, miller, wagon driver, grocer), the natural resources (land, water, seeds, etc.), and the capital resources (wagon, mill and milling machinery, harvesting equipment, bins for flour in store, etc.). Record on a class chart titled "Resources Needed in Flour Production."

- If information is available, compare the nineteenth century milling approach with the modern process for producing flour. Compare the two, noting technological changes.

- Review with students to familiarize them with the specific vocabulary associated with a mill and the operation and design of the nineteenth century machinery.

- Have students predict the time of year a nineteenth century mill would have been the busiest. Have them explain their predictions.

B) Mapping the Mill (from MCPS Social Studies field trip to Peirce Mill):

Using a map of Rock Creek Park or D.C. locate Peirce Mill. Brainstorm with class why a mill would be built near a river or creek. Have the students locate Peirce Mill on a street map of Washington, D. C. Then, have them determine two routes the bus might take to get them there. Have the students estimate the distance to the mill and the length of time it will take to get there for each route.



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Post-visit Activities: From MCPS Social Studies Field trip to Peirce Mill:

1. Using the information they collected, have students discuss and complete the class brainstorming session and words or phrases charts that they started prior to the field trip.
2. Ask students to verify, correct, and make additions to their sequence for production of flour in the nineteenth century. Then provide students with story boards to create a slide show on the sequence of events necessary to make flour. Have them make sketches and write a rough draft of the script. As a class, place the "slides" in order and evaluate and edit the script. Then have students record the script for each picture.
3. Ask several students to research the various kinds of water wheels. If possible, provide the materials and/or time for them to build a model and share their work with the class.
4. Have several students investigate the life of Anna Eugenia Emma Schneider (b. 1889) who was known as the country's first woman miller. Her Baltimore business produced "Eugenia Whole Wheat Flour" and supplied several hundred tins of biscuits for Admiral Byrd's 1939 expedition to the Antarctic. One source for information is *Notable Maryland Women*, edited by Winifred G. Helmes (Cambridge, MD: Tidewater Press, 1977).



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Pre and/or Post Activities:

Recreating the Past

Have your class bring in old pictures of their relatives. Pretend to be detectives and try to guess what kind of people they might have been: record their likes and dislikes, what they might have thought, their personalities, etc. Here is an entertaining game to get everyone involved: sit in a circle, and examine the photographs. When someone has formed the beginning of a story about the forgotten relative, let that person tell it to the group. Pass the item to the next person, and he or she must continue the story where it left off, adding their interesting details to the story. When the photo has gone all the way around the circle, the past relative will have "life" again.

Time Machine

How would it be if a time machine existed?

Present this idea to your class and share stories about how it could be used. If they could go back in time, what would they change? Then, tell them that they have been chosen to travel in such a machine and to have the experience of living, for one day, 100 or 200 years in the past. Ask the students to list all of the items their ancestors would not have owned, such as televisions, computers, cars, cell phones, electric appliances, air conditioners, etc. Have the students plan ahead and live a day without any of these things. Afterwards, sit together and share thoughts about life then and now.

In the Good Old Days

Materials: Inventory Sheets and Homework Sheets

1. Ask the student whether daily life chores have changed since their parents or grandparents were children. Share stories about their parents' or grandparents' childhood stories. Are there activities that children do today that might someday seem dated?
2. Hand out the Inventory Sheets. Have students compare the list to some of the activities that they have done. Next, have students survey their classmates to find out what activities others have done. On "Go," have students move around the room trying to talk to everyone in the class. When they find a student who has done a particular activity, they should write his or her name on the sheet in the blank space after the name of the activity. The object of the activity is to find as many different people who have done different things. Once they have added an individual's name to their inventory, they should move on and question another classmate. (Teachers are encouraged to participate too.)
3. After a designated amount of time, gather students and ask how many lines have been filled with different names. Has anyone filled them all? What is the most unusual activity

someone has done? Complete the inventory by reviewing each activity on the list. Read the list and ask students if they have done a particular activity.

4. Pass out a second inventory, which has been modified slightly, for homework. Have students complete another inventory with their families. (See attachment)

5. After students have done their homework, review their families' responses. Keep a tally of the number of students who have done each activity compared to the number of parents and grandparents. What kind of differences do the students notice? How many students grow their own food? Have their parents or grandparents grown their own food? Are there children other places that do still grow their own food? Where do these necessities come from today? The Peirce Farm is an example of how one family made their living off the land, by growing their own crops and keeping their own cows and other animals.

Back in Time

Try doing some of the activities on the survey sheet with your class.

Global Pumpkin

This is a fun way to teach latitude and longitude, as well as a good fall activity.

First, ask the kids to each bring a pumpkin, not too small and not too big! Then go and get some paint. Ask the kids to bring a paint shirt so they don't get paint on their clothes. Have them paint on the continents, each different colors, but leave the oceans orange.

You can either have the longitude lines as the lines on the pumpkin, or you can paint them on. To paint the latitude and longitude lines, use puffy paint (Fabric Paint) so it is seen easily. Let them dry. Think of it this way, they'll be the only ones on the block with a "Global Pumpkin!"

Pen Pals

Have your class become pen pals with a farmer to learn about daily chores and activities done on modern farms. Consider a local farmer if no one in your class lives on a farm; otherwise, contact someone farming in another part of the country for comparisons (Contact State Department of Agriculture or local extension office for assistance.)

Postcards Galore:

Postcards can be an excellent way of teaching children about places around the world, as there are so many different ways that they can be used. Before you try these activities, you will need a relatively large collection of postcards. So start collecting now - ask friends / family to buy some when they go on holiday, ask the children if they have any postcards at home, buy some which show your local area, join postcard exchange groups etc.

1) **Matching the postcard to the place.** Give the children a collection of postcards and ask them to find the places shown using an atlas, a map or a globe. This will improve the children's knowledge of the location of places around the world. This could be tried in groups and children could have competitions to see who can find the places in the quickest time (this would also improve the children's use of an index if looking in an atlas).

2) **Join Postcard Exchange groups.** There are a number of postcard exchange groups on the internet who are very willing to swap postcards with you. Find them using the search engines, or post a message in the educational newsgroups asking if other classes would be willing to swap postcards. As the postcards arrive at your school, use these opportunities to show the children where they came from, and perhaps teach them a little about the place. The children could even use information resources to find out some information for themselves (which they might then share with their fellow class members later).

3) **Postcard Display.** Make a large display showing the world and stick it to the wall (you could also use a pre-made large wall map if you do not have time to make one). Then, as you receive postcards, ask the children to stick them in the correct place on the display.

4) **Journey of a Postcard.** Give each child a postcard and ask them to find (on a map) where their school is and where the postcard came from. Then, they can describe the journey that the postcard made as it traveled to your classroom. This description could include lists of countries which the postcard might have traveled through / over, and famous places / features which can be found in each of those places.

5) **Make a Postcard.** When the children have a good understanding of what a postcard is, how it is set out and why it is used, they might be able to make their own. These postcards could show their school and class, or other local places of interest (which might require visits outside of the school).

Indeed, this would be an ideal activity to try after a school visit. When on the visit, ask the children to look at some of the postcards which might be on sale (and to possibly buy some to add to the class collection). Then, when they return, they can make their own postcards showing the place(s) which they have visited. If your class is a member of a postcard exchange group, why not ask your exchange partners if they would like to see some of the postcards that you have made?

Children can also make postcards when they have learned about a particular country. Their postcard can include landmarks, animals native to that country, rivers etc.

6) **Make a Tourist Leaflet / GuideBook.** If the children enjoy making postcards, why not get them to make a leaflet / guidebook telling people all about a particular place? They will need to have a collection of existing leaflets and books so that they can see the features of a text of this kind.

7) **Electronic Postcards.** Internet Postcards are now very popular, and they can also be used in the classroom. Once you have found a suitable site, children can fill in their details and send cards to their friends. Most of these cards also have sounds and animations making them even more entertaining. Some of the postcard exchange groups also exchange electronic postcards, so if you receive one, you could print it and use it in the activities above.

Back in Time

Try doing some of the activities on the survey sheet with your class.

In the Good Old Days Inventory Sheet

Find Someone Who Has:

1. Carried firewood _____
2. Dyed yarn with plant dyes _____
3. Carded and/or spun wool _____
4. Fed a pig _____
5. Gone barefoot for a week _____
6. Been hunting or fishing _____
7. Gathered and/or baled hay _____
8. Knit a pair of mittens _____
9. Sewn a patchwork quilt _____
10. Pressed cider _____
11. Made jelly or jam _____
12. Churned butter _____
13. Milked a cow _____
14. Planted a garden _____
15. Ridden a horse _____
16. Plucked a chicken _____
17. Shucked corn _____
18. Split fire wood _____
19. Boiled sap to make maple syrup _____
20. Seen a hen lay an egg _____
21. Watched a horse being shod _____
22. Dipped candles _____
23. Baked bread _____
24. Composted food scraps _____
25. Hulled wheat _____
26. Made rope _____

In the Good Old Days Inventory Sheet

After you've recorded your answers, ask your parents, grandparents (or older neighbor) to answer the following questions. Compare the answers to see the chances that have taken place from the Good Old Days to today.

Have you ever:	You	Parent	Grandparent
1. Carried firewood			
2. Dyed yarn with plant dyes			
3. Carded and/or spun wool			
4. Fed a pig			
5. Gone barefoot for a week			
6. Been hunting or fishing			
7. Gathered and/or baled hay			
8. Knit a pair of mittens			
9. Sewn a patchwork quilt			
10. Pressed cider			
11. Made jelly or jam			
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